

CLAIMS

1. In a smart panel for a wide band noise reduction, an improved smart panel for a wide band noise reduction, comprising:

5 a board structure for decreasing a noise of an audible frequency band;

a sound absorption member attached to one surface of the board structure for decreasing a noise of an audible frequency band; and

10 a piezoelectric unit attached to the board structure for decreasing the noise when the same audible frequency as the resonance frequency of the board structure is propagated.

15 2. The panel of claim 1, wherein said piezoelectric unit includes a plurality of piezoelectric members attached to the back surface of the board structure to which the sound absorption member is attached, and a shunt circuit connected with the piezoelectric member.

15 3. The panel of claim 2, wherein said piezoelectric members are attached to an anti-nodal point which generates a maximum displacement of the board structure for maximizing the noise reduction effect.

4. The panel of claim 2, wherein said shunt circuit is formed of a resistor and an inductor device and is tuned for electrically resonating an electric impedance of each piezoelectric member.

5. In a smart panel for a wide band noise reduction, an improved smart panel for a wide band noise reduction, comprising:

10 a board structure for decreasing a noise of an audible frequency band;  
a sound absorption member attached to an inner surface of one board structure among the opposite board structures for decreasing the noise of an audible frequency band;  
and  
a piezoelectric unit attached to the board structure for decreasing the noise when the same audible frequency as the resonance frequency of the board structure is propagated.

15 6. The panel of claim 5, wherein in said sound absorption member, an air layer is formed between the board structure positioned in the opposite surfaces.